The layered topology of a five components melaminium-melamine hybrid salt of a functional gold(iii) dithiolene complex

Titre	The layered topology of a five components melaminium-melamine hybrid salt of a functional gold(iii) dithiolene complex
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Résumé en anglais	We report the synthesis, characterization and structures of the tetraphenylphoshonium salt of the (maleimide dithiolato)gold(III) complex, (PPh4)+[AuIII(midt)2]−, 1 and the charge-assisted assembly of a gold(III) maleimide dithiolate melamine (mel, 2,4,6-triamino-1,3,5-triazine) melaminium hybrid solvate, (Hmel)+(mel)[Au(midt)2]−·2DMF·2H2O, 2. Compounds 1 and 2 both crystallize in the triclinic P[1 with combining macron] space group. The structure of 1 is identical to that of the one-electron oxidized, paramagnetic complex, (PPh4)+[NiII(midt)2]− reported previously. A non-reversible oxidation wave is observed upon anodic scans at 0.84 V/SCE corresponding to the couple [AuIII(midt)2]1−/0, demonstrating that neutral gold dithiolene complexes of electron poor ligands are not stable. The structure of 2 consists of puckered supramolecular layers. Within one layer, all –NH, –NH2 and O–H hydrogen bond donors are engaged with all available hydrogen bond acceptors, namely the oxygen atoms of the gold dithiolene anion, the dimethylformamide and the water molecules as well as the nitrogen atoms of the triazine cores. A salient feature of this pattern of association is the identification of a [Hmel]+–[mel]–[midt] motif engaging one neutral melamine molecule with one end of one maleimide dithiolate (midt) gold complex ligand, although the opposite midt ligand is not involved in the same motif. Hence, it is remarkable that a [mel]–[midt] motif is stabilized despite the availability of the melaminium cation to be engaged in a direct interaction which would have enhanced the electrostatics of the system. In turn, a dual [Hmel]+–[mel] motif prevails, in effect pulling the ions apart within the layer, directing a pattern of interaction by which the Madelung energy of this ionic solid is effectively reduced.
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